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Notice of Allowability	Application No.	Applicant(s)	
	10/538,709	ZENG ET AL.	
	Examiner	Art Unit	
	Phuong Huynh	2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendment filed 06/25/2007*.

2. ☒ The allowed claim(s) is/are *1,3-10,12-19,21-27 and 29-36*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. John S. Sopko on August 01, 2007.

The application has been amended as follows:

- Claims 3, 12, and 29:
  - At line 2, replace "a leading" with --the first --.
  - At line 3, replace "a trailing" with --the second--.
- Claims 7, 16, and 25:
  - At lines 3, 5 and 6: replace "$M_f(x)$" with --$M_{first}(x)$--; replace "$M_r(x)$" with --$M_{second}(x)$--.
  - At line 7, replace "$M_f(x)$" with --$M_{first}(x)$--; replace "front" with --first--.
  - At line 11, replace "rear" with --second--.
  - At line 12, replace "M_r" with --M_{second}--.
- Claim 27: At line 5, after "towing", insert --a first and a second spaced apart--.

Allowable Subject Matter

2. Claims 1, 3-10, 12-19, 21-27, and 29-36 are allowed.

The following is an examiner's statement of reasons for allowance:

Fleetwood (US Patent No. 4,739,262) discloses a method for removing bias difference between two or more similarly operated magnetometers is disclosed wherein the inherent bias difference due to the magnetic field of the towing vessel is removed without determining its relative magnitude. Magnetic data is gathered and all time related magnetic events except bias level and slope of the time related magnetic events are removed by mathematical adjustment. Point by point statistical analysis is performed to remove the bias level and the time related slope [see Fleetwood: Abstract; col. 1, lines 35-60; col. 2, lines 5-35; col. 2, lines 44-67; col. 3, lines 21-56; col. 5, lines 16-67; and col. 6, lines 45-54; and col. 60-67].

Luscombe (US Patent No. 4,986,121) discloses an apparatus and method for measuring the vertical motion of a floating platform e.g. a survey vessel, caused by wave action. The apparatus includes a sensor having three accelerometers arranged on mutually perpendicular axes so that one accelerometer acts in a vertical plane and the other two act in a horizontal plane. Output signals from the accelerometers are continually sampled through a multiplexer and are passed through an ADC and a shift register to provide output signals for a data processor which provides a signal A indicative of the vertical position of the platform. In the method, the accelerometer output signals are corrected for offsets by use of a reference signal and the corrected signals are used to derive the signal which may be double integrated to obtain the

final signal relating to vertical displacement [see Luscombe: Abstract; col. 2, lines 7-44; col. 2, lines 59-67; col. 3, lines 2-67; and col. 4, lines 35-37].

Hue (US Patent No. 4,515,013) discloses that a buoy has accelerometers and magnetometers for measuring characteristics of an ocean swell. The main plane of the buoy floats on and follows the motion of the free surface of the ocean water. A first accelerometer and a magnetometer are mounted on the buoy and oriented along the axis which is perpendicular to the main plane of the buoy (i.e. perpendicular to the surface of the ocean swell). A pair of accelerometers and magnetometers are mounted in the main plane of the buoy and are oriented along mutually perpendicular axes of that plane. The swell caused acceleration vector is perpendicular to the main plane (i.e. the free surface of the water). The accelerometer oriented perpendicular to the main plane measures the sum of the swell caused acceleration vector and the projection of the gravity vector along the axis of the buoy. The mutually perpendicular pair of accelerometers mounted in the main plane measure the projection of the gravity vector in the main plane of the buoy. The projection of the gravity vector along the axis perpendicular of the buoy are derived from the values of the gravity vector and of the gravity vector components in the main plane of the buoy. The value of the projection of the gravity vector is deducted from the value measured by the first accelerometer for obtaining the acceleration vector due to the swell [see Hue: Abstract; col. 3, lines 14-37 and lines 40-51; col. 7, lines 49-66; and col. 10, lines 45-65].

Regarding claims 1 and 10, the prior art of records does not disclose, suggest or render obvious the combination as claimed wherein "determining an estimate of the gradient of the ship bias from the raw magnetic gradient data obtained by the sensors," "determining the trend of the gradient of the ship bias

from that estimate of the gradient of the ship bias," and "processing the data output to determine the surface structure of the survey area."

Claims 3-9 and 12-18 depend from allowed claims 1 and 10, respectively, and therefore are also allowed.

Regarding claim 19, the prior art of records does not disclose, suggest or render obvious the combination as claimed wherein "determining the gradient of the ship bias from the raw magnetic gradient data obtained by the sensors," "determining the trend of the gradient of the ship bias from the gradient of the ship bias," and "processing the data output to determine the surface structure of the survey region."

Claims 21-26 depend from allowed claim 19, and therefore are also allowed.

Regarding claim 27, the prior art of records does not disclose, suggest or render obvious the combination as claimed wherein "determining an estimate of the gradient of the ship bias from the raw magnetic gradient data obtained by the sensors," "determining the trend of the gradient of the ship bias from that estimate of the gradient of the ship bias," and "processing the corrected gradient data to provide a data output."

Claims 29-36 depend from allowed claim 27 and therefore are also allowed.

Conclusion

3. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong Huynh whose telephone number is 571-272-2718. The examiner can normally be reached on M-F: 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eliseo Ramos-Feliciano can be reached on 571-272-7925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Phuong Huynh
Examiner
Art Unit 2857

PH
July 25, 2007